Space Weather Forecast

Issued on Wednesday, 07 December 2022 at 12:58 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of M-Class flares throughout. Chance of G1/Minor Storm late day 1 or day 2 (7th-8th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with several low level common-class flares observed. There are eight sunspot regions on the Earth-facing side of the Sun, with the disc dominated by a large region in the south centre disk which, despite its size, remains stable. The remaining spots on the disk have shown little growth and remained relatively stable.

There is no evidence of any Earth-bound Coronal Mass Ejections (CMEs) in available satellite imagery.

Solar Wind / Geomagnetic Activity: Solar winds, as observed at L1 by DSCOVR, were at background levels, with a recent upward trend due to the approaching fast wind of coronal hole 53. The total interplanetary magnetic field was weak initially, before becoming moderate from 07/0900 UTC. The north-south range followed a similar trend, becoming mostly moderately negative toward the end of the period. Geomagnetic activity was Quiet for much of the period (Kp 0-1) with the final 0900-1200 UTC interval becoming Unsettled (Kp 3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain at Low levels, with occasional common-class flares and a Chance of isolated moderate-class flares. No significant regions are expected to arrive or depart in the next four days.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections have been observed on available imagery. Solar wind speeds are currently at slow-ambient levels, but are on a gradual incline due to coronal hole 53. This enhancement will likely continue through the end of day 1 (7th) and into day 2 (8th), with a chance of elevated wind speeds. Winds expected to gradually ease by the end of the period as the influence from coronal hole 53 wanes.

Geomagnetic activity is expected to be Quiet initially with a chance of isolated Unsettled intervals. The arrival of coronal hole 53 high speed stream from late day 1 sees Active intervals become likely, with a peak Chance of G1/Minor Storms spanning days 1 and 2 (7th/8th). Geomagnetic activity is expected to return to Quiet as connection to coronal hole 53 weakens on days 3 and 4 (9th/10th).

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the observed lack of even modest X-ray flares.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	40	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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